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MISSOURI WATER QUALITY STANDARDS SUMMARY

Missouri Clean Water Commission
Jefferson City, Missouri

May 1972

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MISSOURI

WATER QUALITY STANDARDS SUMMARY

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U.S. ENVIRONMENTAL PROTECTION AGENCY

MISSOURI CLEAN WATER COMMISSION

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M69o Missouri water quality standards summary. May, 1972. U.S. EPA and Missouri Claan Water Commission

PREFACE

This summary is intended for use by those who have an interest in the water quality standards of the State of Missouri.

The information contained herein has been summarized from 10 documents and amendments thereto prepared by the Missouri Water Pollution Board:*

1. "Big Blue River, Missouri River Basin."
2. "Grand & Chariton Rivers and Tributaries, Grand-Chariton River Basin, Missouri River Basin."
3. "Minor Missouri River Tributaries, Missouri River Basin."
4. "Mississippi River, Upper Mississippi River Basin, Southwest-Lower Mississippi."
5. "Missouri River, Missouri River Basin."
6. "Osage & Gasconade Rivers and Tributaries, Osage-Gasconade River Basin, Missouri River Basin."
7. "St. Francis & Little Rivers & Tributaries and Lower Mississippi River Tributaries, Lower Mississippi River Basin, Southwest-Lower Mississippi."
8. "Salt River & Tributaries, Mississippi River Tributaries, and Des Moines River, Upper Mississippi River Basin."
9. "Spring & Elk Rivers and Tributaries, Grand (Neosho) River Basin, Southwest-Lower Mississippi."
10. "White, North Fork, Spring, Eleven Point, Current & Black Rivers and Tributaries, White River Basin, Southwest-Lower Mississippi."

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*Effective April 12, 1972, Missouri Clean Water Commission.

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SUMMARY OF WATER QUALITY STANDARDS

FOR

THE INTERSTATE WATERS OF MISSOURI

Introduction

In the Water Quality Act of 1965, Congress authorized the establishment of water quality standards for interstate (including coastal) waters. The purpose of these standards is to protect and enhance the quality and productivity of the Nation's interstate waters to serve a variety of beneficial uses, such as public water supply, recreation and protection of aquatic life, and industrial and agricultural uses. This publication summarizes the standards for the general information of the American public and Federal, State and local officials as to the uses and associated requirements for interstate waterways.

The Act, which amended the Federal Water Pollution Control Act, provided for the States to have the first opportunity to establish standards for their interstate waters, which were then subject to review and approval by the Administrator of the Environmental Protection Agency.* All of the States, the District of Columbia and the Territories of Guam, Puerto Rico and the Virgin Islands participated in this landmark effort to set standards. In the course of establishing the standards, public hearings were held by the States and other jurisdictions noted above to give the public an opportunity to participate in setting water quality objectives and standards.

Missouri adopted standards for its interstate waters in June 1967. These standards were then submitted to the Department of the Interior. Subsequently, certain revisions were made by the State in the original standards. The Secretary of the Interior approved the standards as revised on February 8, 1968, with the exception of the minimum dissolved oxygen values for the Missouri River and that part of the Mississippi River below Alton Lock and Dam. On August 22, 1969, the State of Missouri officially changed the

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*Prior to December 2, 1970, the Secretary of the Interior.

dissolved oxygen criterion for the Mississippi River below Alton Lock and Dam as requested by the Secretary of the Interior. Changes in the dissolved oxygen criterion for the Missouri River were officially adopted by the State of Missouri on May 2, 1970.

At the request of the Secretary of the Interior, Missouri adopted a policy to protect its high quality interstate waters. This policy statement was approved by the Secretary of the Interior on June 26, 1968. The Missouri Water Quality Standards as revised were approved by the Secretary of the Interior on July 30, 1970.

The approved standards are both State and Federal standards, enforceable under the State water pollution control statutes and the Federal Water Pollution Control Act, as amended (Section 10). The waters for which standards were adopted are shown on the map in Figure 1, page 4.

The standards consist of three major components: designation of the uses which interstate waters are to serve, specification of narrative and numerical criteria to protect and enhance water quality, and specification of a plan of implementation and enforcement, which includes treatment and control requirements for municipal, industrial and other wastes discharged to or affecting interstate waters. These components are discussed in the following sections. All three are essential to a complete standards program.

The standards are now being implemented. However, there will be continuing research on water quality requirements for various beneficial uses and improved collection and evaluation of water quality data. As more information becomes available and experience with implementing the standards is gained, the standards will be refined and improved to reflect this new knowledge.

Should more detailed information be required on any aspect of the standards, it may be obtained from the Missouri Clean Water Commission or the Environmental Protection Agency Regional Office in Kansas City, Missouri. Missouri has also established water quality standards for its intrastate waters, and information on these standards may be obtained from the Missouri Clean Water Commission. The addresses of these offices are given on page 36.

Other agencies of the State of Missouri which assist the Clean Water Commission with water pollution control activities are:

Missouri Department of Conservation	Assists in water quality studies.

Missouri Division of Health	Checks on adequacy of motel and restaurant sewage facilities and septic tank installations. Conducts radiological sampling and analyses.
Missouri Division of Geological Survey and Water Resources	Checks geology of proposed lagoon locations. Assists in locating and monitoring water pollution problems.
University of Missouri Extension Service	Investigates animal feedlot problems.
Missouri Water Resources Board	Assists U.S. Soil Conservation Service in watershed planning. Coordinates reservoir planning activities.

The addresses of these agencies are also given on page 36.

MISSOURI INTERSTATE WATERS

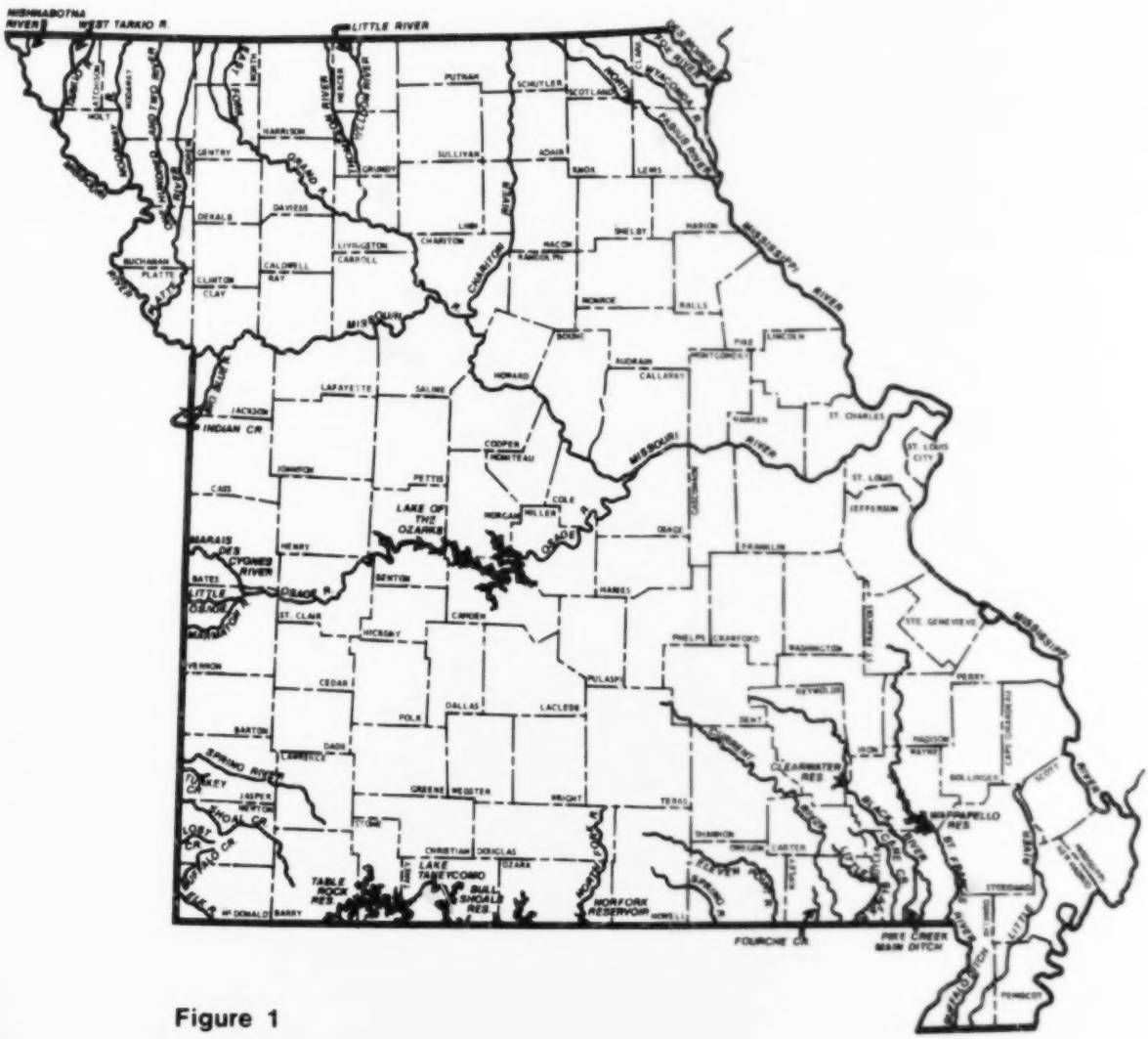

Figure 1

WATER USES

The State of Missouri designates the following uses to be protected in various interstate waters:

- Irrigation
- Livestock Watering
- Propagation of Commercial Fish
- Propagation of Warm Water Sport Fish
- Propagation of Cold Water Sport Fish
- Wildlife Watering
- Industrial Cooling Water
- Industrial Process Water
- Drinking Water Supply
- Hydroelectric Power
- Boating and Canoeing
- Fishing
- Whole Body Water Contact Recreation
- Aesthetic Value
- Receive Effluents
- Navigation
- Receive Surface Runoff

The general aim in designating uses for particular interstate waters is to recognize present uses and practicable future uses, to provide where possible for a variety of uses, and to assure compatibility of standards with Federal, State and local resource planning. In order to satisfy the intent of the Federal Water Pollution Control Act to enhance water quality, the standards specifically provide that no interstate waters may be used solely or primarily for waste assimilation. All interstate waters must be aesthetically pleasing, and this quality is usually protected by narrative criteria preventing unsightly or obnoxious conditions, such as floating debris, oil slicks, unpleasant odors and colors.

Specific use designations for all interstate waters covered by the standards are provided in Figures 2-7, pages 6-15.

FIGURE 2

INTERSTATE WATERS AND DESIGNATED USES

INTERSTATE WATERS	DESIGNATED USES (PRESENT AND FUTURE)																		
	IRRIGATION	LIVESTOCK WATERING	PROPAGATION OF COMMERCIAL FISH	PROPAGATION OF WARM WATER SPORT FISH	PROPAGATION OF COLD WATER SPORT FISH	WILDLIFE WATERING	INDUSTRIAL COOLING WATER	INDUSTRIAL PROCESS WATER	DRINKING WATER SUPPLY	HYDROELECTRIC POWER	BOATING AND CANOEING	FISHING	WHOLE BODY WATER CONTACT RECREATION	AESTHETIC VALUE	RECEIVE EFFLUENTS	RECEIVE SURFACE RUNOFF	NAVIGATION
GRAND-CHARITON RIVER BASIN																			
Chariton River--Iowa-Missouri State line to confluence with Missouri River.	X	X		X		X		#		X	X	X	X		X				
East Fork Grand River--Iowa-Missouri State line to confluence with Grand River.	X	X		X		X		#			X		X	X	X				
Grand River--Iowa-Missouri State line to confluence with Missouri River.	X	X		X		X		X	#	X	X	X	X	X	X				
Little River--Iowa-Missouri State line to confluence with Weldon River.	X	X		X		X					X		X		X				
Thompson River--Iowa-Missouri State line to confluence with Grand River.	X	X		X		X		X			X		X		X				
Weldon River--Iowa-Missouri State line to confluence with Thompson River.	X	X		X		X		#			X		X	X	X				

X - Present and Future Use
- Future Use

FIGURE 3

INTERSTATE WATERS AND DESIGNATED USES

INTERSTATE WATERS	IRRIGATION	LIVESTOCK WATERING	PROPAGATION OF COMMERCIAL FISH	PROPAGATION OF WARM WATER SPORT FISH	PROPAGATION OF COLD WATER SPORT FISH	WILDLIFE WATERING	INDUSTRIAL COOLING WATER	INDUSTRIAL PROCESS WATER	DRINKING WATER SUPPLY	HYDROELECTRIC POWER	BOATING AND CANOEING	FISHING	WHOLE BODY WATER CONTACT RECREATION	AESTHETIC VALUE	RECEIVE EFFLUENTS	RECEIVE SURFACE RUNOFF	NAVIGATION
	DESIGNATED USES (PRESENT AND FUTURE)																
GRAND (NEOSHO) RIVER BASIN																	
Buffalo Creek--Headwaters to Missouri-Oklahoma State line.	X	X		X		X		#		X	X		X		X		
Elk River--Arkansas-Missouri State line to Missouri-Oklahoma State line.	X	X		X		X		#		X	X	X	X	X	X		
Lost Creek--Headwaters to Missouri-Oklahoma State line.	X	X		X		X		#		X	X	X	X	X	X		
Shoal Creek--Headwaters to Missouri-Kansas State line.	X	X		X	X	X		X		X	X	X	X	X	X		
Spring River--Headwaters to Missouri-Kansas State line.	X	X		X	X	X		#		X	X		X	X	X		
Turkey Creek--Headwaters to Missouri-Kansas State line.													X	X	X		

- Present and Future Use
- Future Use

FIGURE 4

INTERSTATE WATERS AND DESIGNATED USES

INTERSTATE WATERS	IRRIGATION	LIVESTOCK WATERING	PROPAGATION OF COMMERCIAL FISH	PROPAGATION OF WARM WATER SPORT FISH	PROPAGATION OF COLD WATER SPORT FISH	WILDLIFE WATERING	INDUSTRIAL COOLING WATER	INDUSTRIAL PROCESS WATER	DRINKING WATER SUPPLY	HYDROELECTRIC POWER	BOATING AND CANOEING	FISHING	WHOLE BODY WATER CONTACT RECREATION	AESTHETIC VALUE	RECEIVE EFFLUENTS	RECEIVE SURFACE RUNOFF	NAVIGATION
	DESIGNATED USES (PRESENT AND FUTURE)																
MISSISSIPPI RIVER BASIN																	
Buffalo Ditch--Headwaters to Missouri-Arkansas State line.		X		X		X					X		X	X	X		
Des Moines River--Iowa-Missouri State line to confluence with Mississippi River.			X	X		X		#			X	X	X		X		
Fox River--Iowa-Missouri State line to confluence with Mississippi River.				X		X			#		X	X	X		X		
Little River--Headwaters to Missouri-Arkansas State line.	X	X		X		X						X	X	X	X		
Mississippi River, Zone 1--Des Moines River to Alton Lock and Dam.			X	X		X	X	X	X		X	X	X	X	X	X	
Mississippi River, Zone 2--Alton Lock and Dam to Missouri-Arkansas State line.	X	X	X			X	X	X	X		X	X		X	X	X	

X - Present and Future Use
- Future Use

FIGURE 4 (contd.)

INTERSTATE WATERS AND DESIGNATED USES

INTERSTATE WATERS	DESIGNATED USES (PRESENT AND FUTURE)																		
	IRRIGATION	LIVESTOCK WATERING	PROPAGATION OF COMMERCIAL FISH	PROPAGATION OF WARM WATER SPORT FISH	WILDLIFE WATERING	INDUSTRIAL COOLING WATER	INDUSTRIAL PROCESS WATER	DRINKING WATER SUPPLY	HYDROELECTRIC POWER	BOATING AND CANOEING	FISHING	WHOLE BODY WATER CONTACT RECREATION	AESTHETIC VALUE	RECEIVE EFFLUENTS	RECEIVE SURFACE RUNOFF	NAVIGATION		
MISSISSIPPI RIVER BASIN (contd.)																		
North Fabius River--Iowa-Missouri State line to confluence with Mississippi River.	X	X		X		X		X			X		X		X			
St. Francis River--Headwaters to Wappapello Reservoir.	X	X		X		X		#		X	X	X	X	#	X			
St. Francis River--Below Wappapello Reservoir to Missouri-Arkansas State line.	X	X	X	X		X		#		X	X	X	X	#	X			
Wappapello Reservoir--Impounds waters of St. Francis River.				X		X				X	X	X	X	X	X			
Wyaconda River--Iowa-Missouri State line to confluence with Mississippi River.	#			X		X		#		X	X		X		X			

X - Present and Future Use
- Future Use

FIGURE 5

INTERSTATE WATERS AND DESIGNATED USES

INTERSTATE WATERS	DESIGNATED USES (PRESENT AND FUTURE)																		
	IRRIGATION	LIVESTOCK WATERING	PROPAGATION OF COMMERCIAL FISH	PROPAGATION OF WARM WATER SPORT FISH	WILDLIFE WATERING	INDUSTRIAL COOLING WATER	INDUSTRIAL PROCESS WATER	DRINKING WATER SUPPLY	HYDROELECTRIC POWER	BOATING AND CANOEING	FISHING	WHOLE BODY WATER CONTACT RECREATION	AESTHETIC VALUE	RECEIVE EFFLUENTS	RECEIVE SURFACE RUNOFF	NAVIGATION	
MISSOURI RIVER BASIN																	
Big Blue River, Zone 1--Kansas-Missouri State line to Indian Creek.			X		X				X			X	X	X			
Big Blue River, Zone 2--Indian Creek to Guinotte Dam.						X			X	X		X	X	X			
Big Blue River, Zone 3--Guinotte Dam to Missouri River.						X							X	X			
Indian Creek--Kansas-Missouri State line to confluence with Big Blue River.						X							X	X			
Missouri River--Iowa-Missouri State line to confluence with Mississippi River.	X	X	X			X	X	X	X	X	X		X	X	X	X			
Nishnabotna River--Iowa-Missouri State line to confluence with Missouri River.	X	X		X		X					X		X		X				

X - Present and Future Use
- Future Use

FIGURE 5 (contd.)

INTERSTATE WATERS AND DESIGNATED USES

INTERSTATE WATERS	DESIGNATED USES (PRESENT AND FUTURE)																	
	IRRIGATION	LIVESTOCK WATERING	PROPAGATION OF COMMERCIAL FISH	PROPAGATION OF WARM WATER SPORT FISH	PROPAGATION OF COLD WATER SPORT FISH	WILDLIFE WATERING	INDUSTRIAL COOLING WATER	INDUSTRIAL PROCESS WATER	DRINKING WATER SUPPLY	HYDROELECTRIC POWER	BOATING AND CANOEING	FISHING	WHOLE BODY WATER CONTACT RECREATION	AESTHETIC VALUE	RECEIVE EFFLUENTS	RECEIVE SURFACE RUNOFF	NAVIGATION
MISSOURI RIVER BASIN (contd.)																		
Nodaway River--Iowa-Missouri State line to confluence with Missouri River.	X	X		X		X		#		X	X		X	X	X			
One Hundred and Two River--Iowa-Missouri State line to confluence with Platte River.	X	X		X		X		X			X		X	X	X			
Platte River--Iowa-Missouri State line to confluence with Missouri River.	X	X		X		X		#			X		X	X	X			
Tarkio River--Iowa-Missouri State line to confluence with Missouri River.	X	X		X		X		#			X		X	X	X			
West Tarkio River--Iowa-Missouri State line to confluence with Tarkio River.	X	X		X		X		#			X		X		X			

X - Present and Future Use
- Future Use

FIGURE 6

INTERSTATE WATERS AND DESIGNATED USES

INTERSTATE WATERS	DESIGNATED USES (PRESENT AND FUTURE)																	
	IRRIGATION	LIVESTOCK WATERING	PROPAGATION OF COMMERCIAL FISH	PROPAGATION OF WARM WATER SPORT FISH	PROPAGATION OF COLD WATER SPORT FISH	WILDLIFE WATERING	INDUSTRIAL COOLING WATER	INDUSTRIAL PROCESS WATER	DRINKING WATER SUPPLY	HYDROELECTRIC POWER	BOATING AND CANOEING	FISHING	WHOLE BODY WATER CONTACT RECREATION	AESTHETIC VALUE	RECEIVE EFFLUENTS	RECEIVE SURFACE RUNOFF	NAVIGATION
OSAGE RIVER BASIN																		
Lake of the Ozarks--Impounds waters of Osage River.			X		X				X	X	X	X	X	X	X			
Little Osage River--Kansas-Missouri State line to confluence with Osage River.		X	X		X						X		X	X	X			
Marmaton River--Kansas-Missouri State line to confluence with Osage River.		X	X		X			#			X		X	X	X			
Osage-Marais des Cygnes River--Kansas-Missouri State line to confluence with Missouri River, excluding Lake of the Ozarks.	X	X	X		X			X		X	X	X	X	X	X			

X - Present and Future Use
- Future Use

FIGURE 7

INTERSTATE WATERS AND DESIGNATED USES

INTERSTATE WATERS	DESIGNATED USES (PRESENT AND FUTURE)																		
	IRRIGATION	LIVESTOCK WATERING	PROPAGATION OF COMMERCIAL FISH	PROPAGATION OF WARM WATER SPORT FISH	PROPAGATION OF COLD WATER SPORT FISH	WILDLIFE WATERING	INDUSTRIAL COOLING WATER	INDUSTRIAL PROCESS WATER	DRINKING WATER SUPPLY	HYDROELECTRIC POWER	BOATING AND CANOEING	FISHING	WHOLE BODY WATER CONTACT RECREATION	AESTHETIC VALUE	RECEIVE EFFLUENTS	RECEIVE SURFACE RUNOFF	NAVIGATION	
WHITE RIVER BASIN																			
Black River--Headwaters to Clearwater Reservoir.	X	X		X		X			#		X	X	X	X	X	X			
Black River--Below Clearwater Reservoir to Missouri-Arkansas State line.	X	X		X		X			X		X	X	X	X	X	X			
Bull Shoals Reservoir--Above Arkansas-Missouri State line. (Impounds flow of White River and tributaries.)				X		X					X	X	X	X	X	X			
Cane Creek--Headwaters to Missouri-Arkansas State line.	X	X		X		X						X		X		X			
Clearwater Reservoir--Impounds waters of Black River.				X		X					X	X	X	X	X	X			
Current River--Headwaters to Missouri-Arkansas State line.	X	X		X	X	X			#		X	X	X	X	X	X			
Eleven Point River--Headwaters to Missouri-Arkansas State line.	X	X		X	X	X			#		X	X	X	X	X	X			

X - Present and Future Use
- Future Use

FIGURE 7 (contd.)

INTERSTATE WATERS AND DESIGNATED USES

INTERSTATE WATERS	DESIGNATED USES (PRESENT AND FUTURE)																		
	IRRIGATION	LIVESTOCK WATERING	PROPAGATION OF COMMERCIAL FISH	PROPAGATION OF WARM WATER SPORT FISH	PROPAGATION OF COLD WATER SPORT FISH	WILDLIFE WATERING	INDUSTRIAL COOLING WATER	INDUSTRIAL PROCESS WATER	DRINKING WATER SUPPLY	HYDROELECTRIC POWER	BOATING AND CANOEING	FISHING	WHOLE BODY WATER CONTACT RECREATION	AESTHETIC VALUE	RECEIVE EFFLUENTS	RECEIVE SURFACE RUNOFF	NAVIGATION	
WHITE RIVER BASIN (contd.)																			
Fourche Creek--Headwaters to Missouri-Arkansas State line.	X	X		X		X						X		X		X			
Lake Taneycomo--Above Arkansas-Missouri State line. (Impounds flow of White River and tributaries.)					X	X			X	X	X	X	X	X	X	X			
Little Black River--Headwaters to Missouri-Arkansas State line.	X	X		X		X						X		X		X			
Norfork Reservoir--Headwaters to Missouri-Arkansas State line. (Impounds flow of North Fork River and tributaries.)				X		X					X	X	X	X	X	X			
North Fork River--Headwaters to Norfork Reservoir.	X	X		X	X	X					X	X	X	X	X	X			
Pike Creek Main Ditch--Black River to Missouri-Arkansas State line.	X	X		X		X						X		X		X			

X - Present and Future Use
- Future Use

FIGURE 7 (contd.)

INTERSTATE WATERS AND DESIGNATED USES

INTERSTATE WATERS	IRRIGATION	LIVESTOCK WATERING	PROPAGATION OF COMMERCIAL FISH	PROPAGATION OF WARM WATER SPORT FISH	PROPAGATION OF COLD WATER SPORT FISH	WILDLIFE WATERING	INDUSTRIAL COOLING WATER	INDUSTRIAL PROCESS WATER	DRINKING WATER SUPPLY	HYDROELECTRIC POWER	BOATING AND CANOEING	FISHING	WHOLE BODY WATER CONTACT RECREATION	AESTHETIC VALUE	RECEIVE EFFLUENTS	RECEIVE SURFACE RUNOFF	NAVIGATION
DESIGNATED USES (PRESENT AND FUTURE)																	
WHITE RIVER BASIN (contd.)																	
Spring River--Headwaters to Missouri-Arkansas State line.	X	X		X		X					X	X	X	X	X	X	
Table Rock Reservoir--Above Arkansas-Missouri State line. (Impounds flow of White River.)				X		X				X	X	X	X	X	X	X	

X - Present and Future Use
- Future Use

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WATER QUALITY CRITERIA

The protection of water quality and uses requires the establishment of numerical and narrative limits on pollutants which damage the uses. The water quality criteria in this section reflect the best scientific judgment available as to the water quality requirements for the assigned uses. Numerical criteria are used wherever it is reasonable to do so. However, narrative criteria are also necessary in some cases, particularly with respect to aesthetic considerations.

Some interstate waters have a higher quality than the minimum levels assigned for protection of water uses, and the standards seek to protect this higher quality as much as possible in the face of increasing social and economic development. Scientific knowledge about the exact water quality requirements for uses is limited; and by preventing degradation of high quality waters, the standards seek to assure optimum, not marginal, conditions to protect the uses associated with clean waters.

Inasmuch as possible, the Missouri standards tailor water quality criteria to present quality or that quality anticipated to result from the establishment of the high treatment requirements. These criteria are outlined on pages 19-30. The standards also contain general narrative criteria, including a statement on controlling degradation of high quality waters, which are given on pages 17-18. These narrative criteria also provide for the protection of small interstate streams which are not covered by specific use designations and criteria.

GENERAL WATER QUALITY CRITERIA - MINIMUM CONDITIONS

1. All tributary streams and all municipal, industrial, agricultural and mining effluents shall not create conditions in the stream which will adversely affect the present water uses or the future water uses as they become current.

2. Minimum water quality conditions applicable to all waters of the State including: 1) low flow streams which are defined as any stream with a flow of 0.1 cfs or less for an average of seven consecutive days which average flow is expected to recur once every two years or less; 2) any streams for which an exception to the water quality criteria has been granted due to low flow conditions or other reasons; and 3) any other streams for which criteria have not been specifically established:

   a. Substances attributable to municipal, industrial, agricultural, mining, or other effluents shall not cause the formation of putrescent or otherwise objectionable sludge deposits on the stream bed.

   b. The stream shall be free from floating debris, oil, scum and other floating materials attributable to municipal, industrial, agricultural, mining or other effluents in amounts sufficient to be unsightly or deleterious.

   c. The stream shall be free from materials attributable to municipal, industrial, agricultural, mining or other effluents producing color, odor or other conditions in such degree as to create a nuisance.

   d. Substances attributable to municipal, industrial, agricultural, mining or other effluents shall not have a harmful effect on human or animal life.

3. The Missouri Water Pollution Board* will require all necessary and reasonable measures to prevent the water quality of all waters of the State from being less than these minimum standards.

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*Effective April 12, 1972, Missouri Clean Water Commission.

Preservation of Missouri's Existing High Quality Waters:

It is recognized that certain of the waters under consideration possess an existing quality which is better than the standards established herein. The quality of these waters will be maintained unless and until it has been affirmatively demonstrated through public hearings that other uses and different standards are justifiable as a result of necessary economic or social development. It will be required that the highest and best technology be employed to maintain the high quality of the waters. Additional data and increased monitoring in cooperation with the Federal Government and other States will permit the improvement of these standards. The interest of the Federal Government in interstate waters is recognized and this interest will be protected.

SPECIFIC WATER QUALITY CRITERIA

Big Blue River (Zones 1 and 2)
Indian Creek

1. There shall be no municipal or industrial effluents discharged to these streams except cooling water.

2. Effluents shall not elevate or depress the average cross-sectional temperature of the stream more than 5° F. The stream temperature shall not exceed 90° F due to effluents.

3. The water quality criteria as set forth under "General Water Quality Criteria - Minimum Conditions" shall apply to these streams until such time as all municipal and industrial effluents are removed from the streams.

- - -

Big Blue River (Zone 3)

1. All effluents and combined sewer overflows to Zone 3 shall be treated and/or controlled so the Missouri River will adhere to its water quality criteria.

2. Municipal and industrial effluents as well as combined sewer overflows shall be treated and/or controlled so nuisance conditions will not develop in this zone.

Fourche Creek
Little Osage River
Pike Creek Main Ditch
Turkey Creek

The water quality criteria as set forth under "General Water Quality Criteria - Minimum Conditions" shall apply to these streams.

Marmaton River

The water quality criteria as set forth under "General Water Quality Criteria - Minimum Conditions" shall apply to the Marmaton River. The Marmaton River will be used for drinking water supply in the future. Substances attributable to

municipal, industrial, agricultural, mining or other effluents shall not adversely affect the future use of this river for drinking water supply. Presently technical task committees are studying the bacterial parameters of sanitary significance relating to sources of drinking water supply. When this value is available, the Missouri Water Pollution Board* will consider adoption of bacterial standards to protect this water use.

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pH

Black River
Buffalo Creek
Buffalo Ditch
Bull Shoals Reservoir
Cane Creek
Chariton River
Clearwater Reservoir
Current River
Des Moines River
East Fork Grand River
Eleven Point River
Elk River
Fox River
Grand River
Lake Taneycomo
Little River (Grand-Chariton River Basin)
Little River (Mississippi River Basin)
Little Black River
Lost Creek
Mississippi River (Zone 1)
Nishnabotna River
Nodaway River
Norfork Reservoir
North Fabius River
One Hundred and Two River
Osage-Marais des Cygnes River
Platte River
St. Francis River
Shoal Creek
Spring River (Grand (Neosho) River Basin)
Table Rock Reservoir
Tarkio River
Thompson River
Wappapello Reservoir
Weldon River
West Tarkio River
Wyaconda River

The pH shall be between 6.5 and 8.5 in the stream. A pH value above 8.5 in the stream must not be due to effluents or surface runoff.

- - -

Lake of the Ozarks

The pH shall be between 6.5 and 8.5 in the lake. A pH value above 8.5 shall not be due to waste discharges.

- - -

Mississippi River (Zone 2)
Missouri River

The pH shall be between 6.5 and 9.0 in the stream. A pH above 9.0 in the stream shall not be due to effluents or surface runoff.

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*Effective April 12, 1972, Missouri Clean Water Commission.

North Fork River

Spring River
(White River Basin)

The pH shall be between 6.5 and 8.5 in the stream. A pH value above 8.5 in the stream must not be due to effluents.

DISSOLVED OXYGEN

Black River
Buffalo Creek
Buffalo Ditch
Cane Creek
Chariton River
Des Moines River
East Fork Grand River
Elk River
Fox River
Grand River
Little River (Grand-Chariton River Basin)
Little River (Mississippi River Basin)
Little Black River
Lost Creek
Mississippi River
Nishnabotna River
Nodaway River
North Fabius River
One Hundred and Two River
Osage-Marais des Cygnes River
Platte River
St. Francis River
Shoal Creek
Spring River (Grand (Neosho) River Basin)
Spring River (White River Basin)
Tarkio River
Thompson River
Weldon River
West Tarkio River
Wyaconda River

The dissolved oxygen in the stream shall not be less than 5 mg/l at any time due to effluents or surface runoff.

- - -

Bull Shoals Reservoir
Clearwater Reservoir
Lake of the Ozarks
Lake Taneycomo
Norfork Reservoir
Table Rock Reservoir
Wappapello Reservoir

The dissolved oxygen in the lake shall not be less than 6 mg/l at any time due to effluents or surface runoff.

- - -

Current River
Eleven Point River
North Fork River

The dissolved oxygen in waters designated for trout fishing shall not be less than 6 mg/l at any time due to effluents or surface runoff.

- - -

Missouri River

Dissolved oxygen concentration shall be maintained at a minimum 5.0 mg/l or greater. It is recognized that this standard is violated at frequent intervals for periods of 2 to 3 weeks

during rising river stages or flooding in the basin. The specific sources which cause such depressions include major contributions from surface runoff (urban areas, farms, and associated activities) which have not been clearly identified. We recognize the need for a coordinated effort on the part of the tributary States and Federal Government to inventory these waste sources so that implementation plans can be developed to remedy the dissolved oxygen deficiency.

TEMPERATURE

Black River (below Clearwater Reservoir)
Buffalo Creek
Buffalo Ditch
Cane Creek
Chariton River
East Fork Grand River
Elk River
Fox River
Grand River
Little River (Grand-Chariton River Basin)
Little River (Mississippi River Basin)
Little Black River
Lost Creek
Mississippi River
Missouri River
Nishnabotna River
Nodaway River
North Fabius River
One Hundred and Two River
Osage-Marais des Cygnes River
Platte River
St. Francis River
Shoal Creek
Spring River (Grand (Neosho) River Basin)
Tarkio River
Thompson River
Weldon River
West Tarkio River
Wyaconda River

Effluents shall not elevate or depress the average cross-sectional temperature of the stream more than 5° F. The stream temperature shall not exceed 90° F due to effluents.

- - -

Black River (above Clearwater Reservoir)
Spring River (White River Basin)

Effluents shall not elevate or depress the average cross-sectional temperature of the stream more than 5° F. The stream temperature shall not exceed 80° F due to effluents.

- - -

Bull Shoals Reservoir
Clearwater Reservoir
Lake of the Ozarks
Lake Taneycomo
Norfork Reservoir
Table Rock Reservoir
Wappapello Reservoir

The temperature of the water in the lake shall not be increased due to any discharges which may be a source of heat.

- - -

Current River Eleven Point River North Fork River

Effluents shall not elevate the average cross-sectional temperature of waters designated for trout fishing more than 2° F.

- - -

Des Moines River

Effluents shall not elevate or depress the average cross-sectional temperature of the stream more than 5° F. The stream temperature shall not exceed 93° F due to effluents.

SUBSTANCES POTENTIALLY TOXIC OR DETRIMENTAL

Black River
Buffalo Creek
Buffalo Ditch
Bull Shoals Reservoir
Chariton River
Clearwater Reservoir
Current River
East Fork Grand River
Eleven Point River
Elk River
Fox River
Grand River
Lake of the Ozarks
Lake Taneycomo
Little River (Grand-Chariton River Basin)
Little River (Mississippi River Basin)
Lost Creek
Nodaway River
Norfork Reservoir
North Fabius River
North Fork River
One Hundred and Two River
Osage-Marais des Cygnes River
Platte River
St. Francis River
Shoal Creek
Spring River (Grand (Neosho) River Basin)
Spring River (White River Basin)
Table Rock Reservoir
Tarkio River
Thompson River
Wappapello Reservoir
Weldon River
West Tarkio River
Wyaconda River

Substances toxic to humans, fish and wildlife or detrimental to agricultural, mining, industrial, recreational or other legitimate uses shall be limited to nontoxic or nondetrimental concentrations in the stream.

- - -

Cane Creek Little Black River Nishnabotna River
Des Moines River

Substances toxic to fish or detrimental to industrial or other legitimate uses shall be limited to nontoxic or nondetrimental concentrations in the stream.

- - -

Mississippi River Missouri River

Substances toxic to humans, fish and wildlife or detrimental to agricultural, mining, industrial, recreational, navigational or other legitimate uses shall be limited to nontoxic or non-detrimental concentrations in the stream.

BACTERIA

Black River	Lake of the Ozarks	North Fork River
Bull Shoals Reservoir	Lake Taneycomo	Osage-Marais des Cygnes River
Chariton River	Little River (Mississippi River Basin)	St. Francis River
Clearwater Reservoir	Lost Creek	Shoal Creek
Current River	Mississippi River (Zone 1)	Spring River (White River Basin)
Eleven Point River	Norfork Reservoir	Table Rock Reservoir
Elk River		Wappapello Reservoir
Grand River		

The fecal coliform, in waters designated for whole body water contact recreation, shall not exceed a geometric mean of 200/100 ml (either MPN or MF count) nor shall more than 10 percent of total samples during any 30-day period exceed 400/100 ml (either MPN or MF count). The above criteria shall not be applicable when the stream is affected by storm water runoff.

- - -

Buffalo Creek	Little Black River	Platte River
Cane Creek	Mississippi River (Zone 2)	Spring River (Grand (Neosho) River Basin)
Des Moines River	Missouri River	Tarkio River
East Fork Grand River	Nishnabotna River	Thompson River
Fox River	Nodaway River	Weldon River
Little River (Grand-Chariton River Basin)	North Fabius River	West Tarkio River
	One Hundred and Two River	Wyaconda River

The fecal coliform, in waters designated for drinking water supply, boating and canoeing, and/or fishing, shall not exceed 2,000/100 ml (either MPN or MF count) except in specified mixing zones adjacent to or downstream from waste outfalls. The above criteria shall not be applicable when the stream is affected by storm water runoff.

TASTE AND ODOR PRODUCING SUBSTANCES

Black River
Buffalo Creek
Chariton River
Current River
Des Moines River
East Fork Grand River
Eleven Point River
Elk River
Fox River
Grand River
Lake Taneycomo
Little River (Grand-Chariton River Basin)
Lost Creek
Mississippi River
Missouri River
Nodaway River
North Fabius River
One Hundred and Two River
Osage-Marais des Cygnes River
Platte River
St. Francis River
Shoal Creek
Spring River (Grand (Neosho) River Basin)
Tarkio River
Thompson River
Weldon River
West Tarkio River
Wyaconda River

Taste and odor producing substances discharged shall be limited to concentrations in the stream that will not interfere with the production of potable water by reasonable water treatment processes, or impart unpalatable flavor to food fish, or result in noticeable offensive odors in the vicinity of the water, or otherwise interfere with the reasonable use of the water.

- - -

Buffalo Ditch
Bull Shoals Reservoir
Cane Creek
Clearwater Reservoir
Lake of the Ozarks
Little River (Mississippi River Basin)
Little Black River
Nishnabotna River
Norfork Reservoir
North Fork River
Spring River (White River Basin)
Table Rock Reservoir
Wappapello Reservoir

Taste and odor producing substances discharged shall be limited to concentrations in the stream that will not impart unpalatable flavor to food fish, or result in noticeable offensive odors in the vicinity of the water, or otherwise interfere with legitimate use of the water.

TURBIDITY

Black River (above Clearwater Reservoir)
Current River
Eleven Point River
North Fork River
Shoal Creek
Spring River (White River Basin)

The turbidity in the stream shall not exceed 10 turbidity units due to effluents.

- - -

Black River
(below Clearwater
Reservoir)

The turbidity in the stream shall not exceed 25 turbidity units due to effluents.

- - -

Buffalo Creek Elk River Lost Creek

The turbidity in the stream shall not exceed 20 turbidity units due to effluents.

- - -

Spring River
(Grand (Neosho)
River Basin)

The turbidity in the stream shall not exceed 15 turbidity units due to effluents.

- - -

Buffalo Ditch	Little River (Grand-Chariton River Basin)	One Hundred and Two River
Bull Shoals Reservoir	Little River (Mississippi River Basin)	Osage-Marais des Cygnes River
Cane Creek	Little Black River	Platte River
Chariton River	Mississippi River (Zone 1)	St. Francis River
Clearwater Reservoir	Nishnabotna River	Table Rock Reservoir
Des Moines River	Nodaway River	Tarkio River
East Fork Grand River	Norfork Reservoir	Thompson River
Fox River	North Fabius River	Wappapello Reservoir
Grand River		Weldon River
Lake of the Ozarks		West Tarkio River
Lake Taneycomo		Wyaconda River

There shall be no turbidity of other than natural origin that will cause substantial visible contrast with the natural appearance of the stream or interfere with its legitimate uses.

COLOR

Black River (above Clearwater Reservoir)	Buffalo Creek	Elk River
	Current River	Lost Creek
	Eleven Point River	Shoal Creek

The color in the stream shall not exceed 10 color units due to effluents.

- - -

Black River
(below Clearwater
Reservoir)

The color in the stream shall not exceed 25 color units due to effluents.

- - -

Spring River
(Grand (Neosho)
River Basin)

The color in the stream shall not exceed 15 color units due to effluents.

- - -

Buffalo Ditch
Bull Shoals
Reservoir
Cane Creek
Chariton River
Clearwater Reservoir
Des Moines River
East Fork Grand
River
Fox River
Grand River
Lake of the Ozarks
Lake Taneycomo
Little River
(Grand-Chariton
River Basin)
Little River
(Mississippi
River Basin)
Little Black River
Mississippi River
Missouri River
Nishnabotna River
Nodaway River
Norfork Reservoir
North Fabius River
North Fork River
One Hundred and
Two River
Osage-Marais des
Cygnes River
Platte River
St. Francis River
Spring River
(White River Basin)
Table Rock Reservoir
Tarkio River
Thompson River
Wappapello Reservoir
Weldon River
West Tarkio River
Wyaconda River

There shall be no color of other than natural origin that will cause substantial visible contrast with the natural appearance of the stream or interfere with its legitimate uses.

OIL AND GREASE

Bull Shoals
Reservoir
Clearwater Reservoir
Lake of the Ozarks
Lake Taneycomo
Norfork Reservoir
Table Rock Reservoir
Wappapello Reservoir

The lake shall be virtually free of oil and grease.

- - -

Black River
Buffalo Creek
Buffalo Ditch
Cane Creek
Chariton River
Current River
Des Moines River
East Fork Grand River
Eleven Point River
Elk River
Fox River
Grand River
Little River (Grand-Chariton River Basin)
Little River (Mississippi River Basin)
Little Black River
Lost Creek
Mississippi River
Missouri River
Nishnabotna River
Nodaway River
North Fabius River
North Fork River
One Hundred and Two River
Osage-Marais des Cygnes River
Platte River
St. Francis River
Shoal Creek
Spring River (Grand (Neosho) River Basin)
Spring River (White River Basin)
Tarkio River
Thompson River
Weldon River
West Tarkio River
Wyaconda River

The stream shall be virtually free of oil and grease. Emulsified oil and grease concentrations shall be kept below levels which will interfere with beneficial uses of the stream.

SOLIDS

Black River
Buffalo Creek
Buffalo Ditch
Cane Creek
Chariton River
Current River
Des Moines River
East Fork Grand River
Eleven Point River
Elk River
Fox River
Grand River
Little River (Grand-Chariton River Basin)
Little River (Mississippi River Basin)
Little Black River
Lost Creek
Mississippi River (Zone 1)
Nishnabotna River
Nodaway River
North Fabius River
North Fork River
One Hundred and Two River
Osage-Marais des Cygnes River
Platte River
St. Francis River
Shoal Creek
Spring River (Grand (Neosho) River Basin)
Spring River (White River Basin)
Tarkio River
Thompson River
Weldon River
West Tarkio River
Wyaconda River

There shall be no noticeable man-made deposits of solids either organic or inorganic in nature on the stream bed. The stream shall be free of floating debris, scum, and other floating materials attributable to municipal, industrial or other waste disposal practices in amounts sufficient to be unsightly or deleterious.

- - -

Bull Shoals Reservoir
Clearwater Reservoir
Lake of the Ozarks
Lake Taneycomo
Norfork Reservoir
Table Rock Reservoir
Wappapello Reservoir

The lake shall be free of floating debris, scum and other floating materials attributable to municipal, industrial or other waste disposal practices in amounts sufficient to be unsightly or deleterious. The lake floor shall be free of materials which will adversely alter the composition of the bottom fauna, interfere with the spawning of fish or their eggs or adversely change the physical nature of the bottom.

- - -

Mississippi River (Zone 2)
Missouri River

There shall be no noticeable man-made deposits of organic solids on the stream bed. The stream shall be free of floating debris, scum, and other floating materials attributable to municipal, industrial or other waste disposal practices in amounts sufficient to be unsightly or deleterious.

RADIOACTIVE MATERIALS

Black River
Buffalo Creek
Chariton River
Current River
East Fork Grand River
Eleven Point River
Elk River
Fox River
Grand River
Lake Taneycomo
Little River (Grand-Chariton River Basin)
Lost Creek
Mississippi River
Missouri River
Nodaway River
North Fabius River
One Hundred and Two River
Osage-Marais des Cygnes River
Platte River
St. Francis River
Shoal Creek
Spring River (Grand (Neosho) River Basin)
Tarkio River
Thompson River
Weldon River
West Tarkio River
Wyaconda River

The dissolved radium 226 and strontium 90 shall not exceed 3 and 10 picocuries/liter (pc/l) respectively in the stream due to effluents or surface runoff. In the absence of strontium 90 and alpha emitters, the gross beta concentration shall not exceed 1,000 pc/l in the stream due to effluents or surface runoff.

FLUORIDES

Black River
Buffalo Creek
Chariton River
Current River
East Fork Grand River
Eleven Point River
Elk River
Fox River
Grand River
Lake Taneycomo
Little River (Grand-Chariton River Basin)
Lost Creek
Mississippi River
Missouri River
Nodaway River
North Fabius River
One Hundred and Two River
Osage-Marais des Cygnes River
Platte River
St. Francis River
Shoal Creek
Spring River (Grand (Neosho) River Basin)
Tarkio River
Thompson River
Weldon River
West Tarkio River
Wyaconda River

The soluble fluoride concentration in the stream shall not exceed 1.2 mg/l due to effluents or surface runoff.

LEAD AND ZINC

Spring River (Grand (Neosho) River Basin)

The natural lead and zinc concentrations in Southwest Missouri and Southeast Kansas streams are significant; therefore, it will be necessary to control discharges of these metals. Insofar as possible, concentrations of lead and zinc in the stream shall not exceed 0.1 mg/l and 1 mg/l respectively.

IMPLEMENTATION PLAN

The "action" plan of the standards is the plan of implementation and enforcement. This plan sets forth the requirements for treatment and/or control of all conventional municipal and industrial waste discharges in the State which affect interstate waters, specifies the time within which this is to be accomplished, and contains programs for dealing with other water pollution control problems.

The Missouri standards require completion of secondary treatment facilities or the equivalent or higher for all municipal and industrial wastes discharged to the Missouri and Mississippi Rivers by December 31, 1975. Information on the requirements for any particular discharger may be obtained from the Missouri Clean Water Commission.

Other programs to control and abate pollution are developed in the standards with a plan of action as follows:

1. Land erosion with the resulting silt causes the greatest damage to the water quality of the Mississippi and Missouri Rivers. Other interstate streams in Missouri which suffer from this problem include the St. Francis River, Little River (Mississippi River Basin), Buffalo Ditch, Osage River, and interstate tributaries to the Missouri River flowing between Iowa and Missouri. The Missouri Clean Water Commission in cooperation with Federal and State Departments of Agriculture locates heavy sediment-contributing areas and proposes remedial measures.

2. Agricultural wastewaters are suspected of being detrimental to the water quality of the Missouri River. Sufficient evidence of noncompliance with the established water quality standards will result in correction of this condition.

3. Wastes from vessels and marinas are controlled by Missouri's Marine Sewage Disposal Law (Chapter 306.260 RSMo Cumulative Supplement 1971), which is administered by the Clean Water Commission. Discharge of sewage from boats is prohibited. Boats engaged in interstate commerce on the Mississippi and Missouri Rivers are exempt in the Marine Sewage Disposal Law.

4. Combined sewer overflows. The Missouri Clean Water Commission prohibits construction of new combined sewers and extensions to present combined sewers.

GLOSSARY OF TERMS

Advanced Waste Treatment--Refers to methods and processes that will remove more contaminants from wastewater than are usually removed in present-day conventional treatment plants. The processes may be physical, chemical, biological, or combinations of these. Examples of advance waste treatment are carbon adsorption, coagulation, reverse osmosis, electrodialysis, and ion exchange.

Bacteria--The best indicator of the sanitary quality of water has been an estimate of the density of coliform bacteria. There are two classifications:

(1) Coliform or total coliform bacteria include a heterogeneous grouping of bacteria which are identified by bacteriological procedures to be gram-negative, non-spore-forming, rod-shaped organisms which will ferment lactose with gas formation within 48 hours at 35° C in either an aerobic or facultative anaerobic environment. Since these bacteria are present in large numbers in fecal wastes, they have been a traditional bacteriological tool used to measure the occurrence and intensity of fecal contamination in stream pollution investigations.

(2) Fecal coliform bacteria are that portion of coliform population which are capable of lactose fermentation at an elevated temperature of 44.5° C. Unlike some strains of nonfecal members of the total coliform group, fecal coliforms have a specific high order of positive correlation with warm-blooded animal pollution, survive for shorter time in water and soil, and more closely correlate with survival patterns of enteric pathogenic bacteria.

Biochemical Oxygen Demand (BOD)--The BOD is the measure of the amount of oxygen necessary to satisfy the biochemical oxidation requirements of organic matter at the time the sample is collected. Unless otherwise specified, this term will mean the 5-day BOD incubated at 20° C. Waste discharges containing high levels of BOD reduce dissolved oxygen concentrations in the receiving waters.

Commercial Fishing--The harvesting of fish primarily for sale.

Disinfection--The killing of the larger portion (but not necessarily all) of the harmful and objectionable microorganisms in, or on, a medium by means of chemicals, heat, ultraviolet light, etc. Disinfection by chlorination is the method most commonly used in sewage treatment processes.

Dissolved Oxygen (D.O.)--The oxygen dissolved as a gas in sewage, water, or other liquid usually expressed in milligrams per liter (mg/l), parts per million (ppm) or percent saturation. Adequate dissolved oxygen levels are necessary in waters to protect fish and other aquatic life and to prevent offensive odors. Low dissolved oxygen concentrations in receiving waters are generally due to the presence of excessive organic material as a result of inadequately treated or controlled waste (having high BOD). Excessive algal growths may cause vastly fluctuating dissolved oxygen levels. Other factors such as temperature, depth of water, and water movement influence dissolved oxygen levels.

Interstate Waters--Under the Federal Water Pollution Control Act, interstate waters are defined as:

(1) rivers, lakes and other waters which flow across or form a part of State or international boundaries;

(2) waters of the Great Lakes;

(3) coastal waters--whose scope has been defined to include ocean water seaward to the territorial limits and waters along the coastline (including inland streams) that are influenced by the rise and fall of the tide.

Intrastate Waters--Rivers, lakes, and other waters wholly within the State, which do not flow across nor form a part of the boundaries of the State.

Membrane Filter (MF)--A technique of bacterial analysis. This technique involves the running of a certain volume of water through a cellulose ester wafer which is then impregnated with growth media for bacteria.

Milligrams Per Liter (mg/l)--Milligrams of solute per liter of solution. Equivalent to parts per million assuming unit density.

"Most Probable Number" (MPN)--A test of bacterial density expressed as a number of organisms per hundred milliliters. It is a number most likely to occur, using statistical methods, under the given circumstances or conditions of the test.

pH--The index of hydrogen ion activity used to indicate the relative intensity of acidity or alkalinity of water with the neutral point at 7.0. The pH of most natural waters ranges from 6.5 to 8.5. Waters having a pH at these levels are favorable for most surface water uses including all aspects of desirable aquatic life. A pH outside this range is caused, in most cases, by decaying vegetation, inadequately treated industrial wastes, or mine drainage entering the water body.

Pollution*--Such contamination, or other alteration of the physical, chemical or biological properties, of any waters of the State, including change in temperature, taste, color, turbidity, or odor of the waters, or such discharge of any liquid, gaseous, solid, radioactive, or other substance into any waters of the State as will or is reasonably certain to create a nuisance or render such waters harmful, detrimental or injurious to public health, safety or welfare, or to domestic, industrial, agricultural, recreational, or other legitimate beneficial uses, or to wild animals, birds, fish or other aquatic life.

Recreation, Whole Body Water Contact--Activities in which there is prolonged and intimate contact with the water involving considerable risk of ingestion. This includes water uses such as swimming, water skiing and skindiving. Also called "Primary Contact Recreation."

Sewage--(1) The water supply of a community after it has been used and discharged into a sewer; (2) wastewater from the sanitary conveniences of dwellings, business buildings, factories and other institutions.

Sewage, Combined--A sewage containing both sanitary sewage and surface or storm water with or without industrial wastes.

Sewer, Combined--A sewer which carries both sanitary sewage and storm drainage. At times of heavy rainfall, the capacity of combined sewers may be exceeded and sewers will overflow. The overflow will bypass the sewage treatment plant and the combined wastewaters will be discharged directly into streams without treatment of any kind. This is a problem in many older cities in the United States, and there are various programs to deal with it.

Solids, Settleable--Substances such as erosional silt, organic detritus, plankton, and sand which, because of particle size or lack of water currents, settle to the stream bed or lake bottom.

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*As defined by Missouri State statute.

Solids, Suspended--Solids that either float on the surface of or are held in suspension by water currents.

Temperature--A measure of the hotness or coldness of water. While temperature is affected by natural conditions, man has a significant effect by the construction and operation of dams and the discharge of cooling waters from industrial processes, particularly power generation.

Toxic Materials--These may include hundreds of compounds present in waters due to industrial wastes, runoff from farm lands where pesticides have been applied, and other materials which are harmful to human, plant, animal and aquatic life.

Treatment, Primary--May be defined as that process or group of processes capable of removing a high percentage of floating and settleable solids. This is the first major treatment in a sewage treatment works and generally removes from 30 to 65 percent of the 5-day biochemical demand.

Treatment, Secondary--May be defined as that process or group of processes capable of removing virtually all floating and settleable solids, generally from 80 to 95 percent of the 5-day biochemical oxygen demand, and a similar level of removal of suspended solids in untreated waste. The equivalent treatment may generally be defined as that process or group of processes achieving maximum practicable removal of solids, oils, grease, acids, alkalis, toxic materials, bacteria, taste and odor-causing materials, color and any other objectionable constituents contained in untreated waste to produce an effluent equivalent to that obtained from secondary treatment facilities in current use for any specific category of industrial waste.

Warm- and Cold-Water Fish--Warm-water fish include black bass, sunfish, catfish, gar and other. Cold-water fish include salmon and trout, whitefish, miller's thumb and blackfish. The temperature factor determining distribution is set by adaptation of the eggs to warm or cold water.

FEDERAL AND STATE AGENCY ADDRESSES

State Agencies

Missouri Clean Water Commission
P. O. Box 154
Jefferson City, Missouri 65101

Missouri Department of
Conservation
P. O. Box 180
Jefferson City, Missouri 65101

Missouri Division of Geological
Survey and Water Resources
P. O. Box 250
Rolla, Missouri 65401

Missouri Division of Health
Jefferson City, Missouri 65101

University of Missouri
Extension Service
Whitten Hall
Columbia, Missouri 65201

Missouri Water Resources Board
112 West High Street
Jefferson City, Missouri 65101

Federal Agencies

Environmental Protection Agency
Washington, D.C. 20460

Environmental Protection Agency
Region VII
1735 Baltimore Avenue
Kansas City, Missouri 64108

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